# Memorandum of Understanding

## for Maintenance and Operation of the ALICE Detector

**between**

The EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH,

hereinafter referred to as CERN, Geneva, as the Host Laboratory

on the one hand

**and**

a Funding Agency / Institution of the ALICE Collaboration

on the other hand.

## Preamble

(a) A group of Institutes from CERN Member and non-Member States, and CERN, has agreed to collaborate to form the ALICE Collaboration. This Collaboration has proposed to CERN an experiment to study particle interactions at the highest possible energies and luminosities to be reached with the Large Hadron Collider (LHC). These Institutes have secured the support of their Funding Agencies to enable them to participate in the ALICE Collaboration.

(b) Agreement to this Collaboration has been effected through the signature of Memoranda of Understanding (ALICE RRB-D 00-41) between each Funding Agency or Institute, as appropriate, in the Collaboration and CERN as the Host Laboratory. These Memoranda of Understanding for construction (Construction MoUs) collectively define the Collaboration and its objectives, and the rights and obligations of the collaborating Institutes in construction matters during the construction period.

(c) In their Article 6.6, the Construction MoUs specify that the responsibilities for the maintenance and operation (M&O) of the ALICE detector are to be laid down in a separate Memorandum of Understanding on maintenance and operation procedures (M&O MoU), to be signed by all the Parties. Agreement is effected as for construction, i.e. through Memoranda of Understanding between each Funding Agency or Institute, as appropriate, in the Collaboration and CERN as the Host Laboratory. While the Construction MoUs remain valid, their provisions take precedence over those of the M&O MoUs.

(d) The Resources Review Board (RRB) referred to in Preamble (g) of the Construction MoU is defined therein to have the following roles with respect to M&O :

- reaching agreement on a maintenance and operation procedure and monitoring its functioning
- endorsing the annual maintenance and operation budgets of the detector

The management of the Collaboration reports regularly to the RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

(e) The present M&O MoUs are not legally binding, but the Funding Agencies and Institutes recognise that the success of the experiment depends on all members of the Collaboration adhering to their provisions. Any default will be dealt with in the first instance by the Collaboration and if necessary then by the RRB.

## Article 1 : Annexes

1.1 All the Annexes are an integral part of this MoU.

1.2 Annexes 1, 2, 4, 5 and 6 shall be identical to Annexes 1, 2, 3, 5 and 6 (including any amendments thereto) of the Construction MoU. When the latter ceases to be valid, amendments to these Annexes shall be made in accordance with the provisions of this M&O MoU.

## Article 2 : Parties to this MoU

2.1 The Parties shall be all the Institutes of the Collaboration as listed in **Annex 1** and their Funding Agencies, and CERN as the Host Laboratory. **Annex 2** lists the Funding Agencies and their duly authorised representatives. The Funding Agency may be an Institute or an established institution acting on behalf of one or more Institutes.

2.2 The collaborating Institute(s) and the ALICE Collaboration will hereinafter be referred to as “Institute(s)” and “Collaboration”, respectively.

## Article 3 : Purpose of this MoU

3.1 This MoU addresses the pre-exploitation and exploitation phases of the ALICE detector. Its purpose is to define the procedure for determining the maintenance and operation (M&O) costs in these phases along with the mechanisms by which they are reviewed and by which the charges and responsibilities for the execution of this work are distributed amongst the Parties. It sets out organisational,

managerial and financial guidelines to be followed by the Collaboration. It does not address the offline computing needs of the Collaboration. These will the subject of a separate Memorandum of Understanding for LHC Computing as described in the document "Proposal for Building the LHC Computing Environment" (CERN/3279 Rev.).

3.2 Exploitation refers to the time after data-taking for physics has commenced at the LHC. Pre-exploitation refers to the time before this and in particular, for individual sub-detector/system components of the ALICE detector, to the time after they have been commissioned.

3.3 M&O comprises all of the actions needed to fulfil the ALICE Collaboration co-ordination function and to operate and keep in good working order the individual components of the ALICE detector, along with their respective infrastructure and facilities.

3.4 The ALICE project is executed in the normal framework of the CERN scientific programme, approved by the CERN Council and subject to the bilateral Agreements and Protocols between CERN and non-Member States.

3.5 In case of conflict between relevant Co-operation Agreements or Protocols entered into by CERN and the present MoU, the former prevail.

## Article 4 : Duration of this MoU and its Extension

4.1 The initial period of validity of this MoU covers the pre-exploitation phase of the ALICE detector and the expected first five years of physics running, i.e. from 1 May 2002 to 31 December 2011.

4.2 The validity of this MoU will be extended automatically at its expiry for successive periods of five years beyond the initial period unless the RRB determines otherwise. This provision notwithstanding, the MoU will automatically cease to be valid when the LHC programme is declared closed by the CERN Council.

4.3 The provisions of this MoU will apply to elements of the ALICE detector as they begin to incur M&O costs, as distinct from the costs that belong to the construction phase and are defined in Article 2.2 of the Construction MoU.

4.4 Any Funding Agency may withdraw its support from the Collaboration by giving not less than eighteen months notice in writing to the Collaboration and the Director General of CERN. In such an event, reasonable compensation to the Collaboration will be negotiated through CERN and confirmed by the RRB.

4.5 Any Institute may withdraw from the Collaboration according to the procedures agreed by the Collaboration, subject to the General Conditions for Experiments Performed at CERN (**Annex 3**), and by giving notice in writing to its Funding Agency.

4.6 Any Institute that joins the Collaboration in accordance with the Collaboration rules during the period of validity of this MoU shall accept the agreements in force and will be expected to make an appropriate contribution to the M&O. This will be negotiated by the Collaboration (which reserves the right to request additional contributions from such Institutes) and endorsed by the RRB.

## Article 5 : The ALICE Detector and Collaboration

5.1 The detector for the ALICE experiment has been described in detail in the Technical Proposal submitted to the LHCC in December 1995 and in the subsequent sub-detector/system Technical Design Reports. It consists of a number of sub-detector/system units as listed in **Annex 4**.

5.2 The current management structure of the Collaboration is described in **Annex 5**.

5.3 The technical participation of the Institutes in detector construction, grouped by Funding Agency, is set out in **Annex 6**.

5.4 The Collaboration shall update Annexes 5 and 6 annually to reflect the situation on 1 January of the current year.

## Article 6 : Responsibilities of the Institutes for the Maintenance and Operation of the ALICE Detector, and of CERN as Host Laboratory

6.1 Responsibility for the M&O of the ALICE detector rests jointly with the Collaboration as a whole and with CERN as Host Laboratory, within the General Conditions for Experiments Performed at CERN. It is a fundamental principle that each Institute within the Collaboration shall participate in both maintenance and operation and contribute a fair and equitable share of common costs.

6.2 It is also a fundamental principle that an Institute, which has contributed a component of equipment, will also contribute to the necessary scientific and technical manpower support to operate that component and maintain it in good working order.

6.3 Within the fundamental principles set out in Articles 6.1 and 6.2 above, the Collaboration shall, for each M&O cost item, decide whether the cost is to be borne at the common expense of the Collaboration or not. The M&O cost items are thereby divided into two categories :

6.3.1 Common Items, comprising those costs that the Collaboration has agreed to bear at its common expense, and

6.3.2 Sub-detectors/systems that are the responsibility of individual Institutes or groups of Institutes.

6.4 **Annex 7** lists the M&O cost items agreed by the Collaboration to be Common Items.

6.5 **Annex 8** lists for the second category, by sub-detector/system, the deliverables provided by the Institutes, the CORE value of these deliverables and the sharing among Institutes. Also summarised are the CORE values of the deliverables for particular sub-detectors/systems by Funding Agency.

6.6 The general obligations of CERN in its role as Host Laboratory and of the Institutes (including CERN in this role) are contained in the General Conditions for Experiments Performed at CERN (Annex 3), which in case of contradiction or ambiguity shall prevail over the main body of this MoU.

## Article 7 : Maintenance and Operation Categories

7.1 The M&O expenses can be divided into the following three categories :

7.1.1 **Category A**. M&O expenses that are shared by the entire Collaboration (cf. Article 6.3.1 above). **Annex 9** lists the headings under which Category A costs are categorised.

7.1.2 **Category B**. M&O expenses that are borne by part of the Collaboration, i.e. by single Institutes or groups of Institutes, and their Funding Agencies (cf. Article 6.3.2 above). The headings in this category are defined with reference to the distribution of responsibilities amongst the various Institutes for the construction of the ALICE Detector as given in Annex 8. **Annex 10** lists the headings under which Category B costs are categorised and the Institutes concerned.

It is agreed that an Institute having responsibility under a Category B heading will contribute to providing the necessary financial, scientific and technical support, as well as replacement or spare parts, for normal operation of that equipment and for the routine maintenance needed to keep it in good working order. If problems arise that require major modifications, responsibility will lie with the Collaboration as a whole. The Collaboration will propose on a case-by-case basis the events to which this provision will apply. The proposal will be submitted for approval to the next RRB meeting, which will also be asked to approve the provision of the necessary resources.

7.1.3 **Category C**. General maintenance and operation expenses that are provided to the Collaboration by CERN, acting in its role as Host Laboratory. Subject to the General Conditions for Experiments Performed at CERN (Annex 3), these are more precisely described in the list given in **Annex 11**.

## Article 8 : Approval and Oversight

8.1 Oversight of the M&O costs for the ALICE detector shall lie with the RRB, which will meet normally twice per year, in spring and autumn. The RRB shall have the responsibility for approving the levels and sharing of the Category A costs. It shall also approve the overall level of Category B costs and the sharing of these costs as proposed by the Collaboration.

8.2 The RRB shall be assisted in this aspect of its work by a Scrutiny Group that it shall appoint. The role of the Scrutiny Group is to analyse critically the Collaboration's M&O reports and estimates, refine the Category A estimates in consultation with the Collaboration and advise the RRB on the course of action to take.

8.3 The Scrutiny group shall operate according to the procedures set out in **Annex 12**.

## Article 9 : Cost Sharing

9.1 Subject to exceptions that may be agreed on a case-to-case basis by the RRB, the following guidelines are agreed for the sharing of M&O costs :

9.2 For Category A, the costs are to be shared amongst the Funding Agencies or Institutes in proportion to the number of their scientific staff holding PhD or equivalent qualifications who are entitled to be named as authors of scientific publications of the Collaboration. To this end, the Collaboration shall maintain a list, by Funding Agency and Institute, of these persons (**Annex 13**). The Collaboration shall update this list annually to reflect the situation on 30 September. The updated list is to be ready in time for the autumn meeting of the RRB (see Article 10.1 below).

9.3 Funding Agencies or their Institutes must normally pay their share of Category A costs in cash. In exceptional circumstances some of the Category A costs could eventually be paid in kind with the agreement of the RRB, subject always to a minimum fixed cash amount per Institute. In such cases the cash value attributed to the in-kind contribution shall also be agreed by the RRB. The Collaboration shall propose annually to the RRB the minimum fixed cash amount to be applied in the following year.

9.4 CERN will pay from its operating budget the energy costs falling on Member States. In recognition of the contributions made to the construction of the LHC machine by some non-Member States, CERN will treat these countries in a manner analogous to Member States and will partially pay the energy costs that fall on their Funding Agencies and Institutes.

The non-Member States for which CERN will partially pay the energy costs are listed in **Annex 14**.

CERN Management shall propose annually in its Medium Term Plan (The Scientific Activities of CERN and Budget Estimates for the Years n - n+3) the overall size of these energy payments for the following year, so that they may be incorporated in the M&O budget presented to the RRB for approval in October. The payments are shared amongst the countries concerned according to a formula, the current version of which is explained in **Annex 15**. Any modifications to the arrangements for these payments will also be proposed in the context of the Medium Term Plan.

9.5 For Category B, the costs are to be shared by the Funding Agencies and Institutes concerned in a manner that the Collaboration shall propose to the RRB.

9.6 For Category C, the costs are paid by CERN from its operating budget.

9.7 The boundary between Category A and Category B costs is determined by the Collaboration as explained in Article 6.3 above. Category C costs are determined by the CERN Director General, having regard to the General Conditions for Experiments Performed at CERN and, in particular, the need to provide a safe and secure environment for the operation of the ALICE detector.

## Article 10 : Procedure

10.1 Proposals for providing and sharing Category A M&O costs according to the criteria set out in Article 9 above, including the proposal for the minimum fixed cash amount per Institute, will be drawn up annually by the Collaboration and submitted to the RRB at its spring meeting. At the same meeting, the Collaboration will report on Category B costs and on the proposed responsibilities and commitments for these, while CERN will report on Category C costs. The information for all Categories will comprise the M&O expenses for the previous year and the proposals for the following year, along with estimates for the three subsequent years. The Scrutiny Group will then operate during the summer, with the aim of agreeing the estimates for Category A for the following year, so that they can be endorsed at the autumn meeting of the RRB. It will also make critical comment on the arrangements for Category B costs.

10.2 The RRB will approve the M&O budget for the following year at its autumn meeting.

10.3 Unless explicitly mentioned, all proposals and estimates are to be expressed in Swiss Francs, using the calculated CERN index for materials cost variations.

10.4 For Category A expenses, a common Maintenance and Operation account (M&O Account) will be opened in the name of the Collaboration. All payments made by CERN on behalf of the Collaboration and the related receipts will be shown in that account.

10.5 CERN will issue invoices in Swiss Francs to the Funding Agencies of the Collaboration for their M&O contributions. The detailed procedure for the payment of Category A contributions is set out in **Annex 16**.

10.6 For Category A, the Resources Co-ordinator (see Annex 5) and other named individuals as necessary will be authorised by the Collaboration to sign commitments and payments relating to the above-mentioned account within the limits of the agreed annual budget for Category A. The authorised signature levels for these persons will be subject to the standard CERN rules for Team Accounts.

10.7 The Resources Co-ordinator shall report annually to the autumn meeting of the RRB on the functioning of the M&O arrangements for Categories A and B, and shall point out any cases of default (see Article 12.3 below). At the same meeting CERN Finance Division shall report on the status of the Collaboration accounts for Category A and those parts of Category B for which accounts exist at CERN.

10.8 If, for any reason, the RRB should fail to reach agreement on the M&O costs or on their sharing, the arrangements that it last agreed will continue to apply until agreement is reached.

## Article 11 : Rights and Benefits of Institutes

11.1 The Institutes participating in the Collaboration are entitled to join the pre-exploitation and exploitation phases of the project and to participate in the scientific exploitation of the data acquired. Further details are set out in the document “General Conditions for Experiments Performed at CERN” (Annex 3).

## Article 12 : Administrative and Financial Provisions

12.1 General financial matters and purchasing rules and procedures for the LHC experiments, including the rules that apply for Common Fund operations, are dealt with in accordance with the "Financial Guidelines for the LHC Collaborations" (CERN / FC / 3796).

12.2 Under the provisions of the CERN basic Convention dated 1st of July 1953 and revised on 17 January 1971, any Institute's staff and property located at CERN shall be subject to the authority of the CERN Director-General and shall comply with the CERN regulations.

12.3 Default on provision of the agreed contributions for M&O shall engage the procedure for resolution of disputes described in Article 14.1 below and may result in specific action against the defaulter. Should the outcome of the dispute resolution procedure imply a loss of M&O contributions to the Collaboration, the question of recovery from the loss is for the RRB to address.

## Article 13 : Amendments

13.1 The Collaboration will make every effort to ensure that the information contained in the Annexes to this MoU is kept up-to-date. To this end it shall review the information at least annually in time for the autumn meeting of the RRB.

13.2 This MoU may be amended at any time with the agreement of its signatories or of their appointed successors. Any such amendments will be subject to the prior agreement of the RRB.

## Article 14 : Disputes

14.1 As indicated in the Preamble (e), the primary mechanism for resolution of any disputes shall be negotiation within the Collaboration in the first instance and then if necessary in the RRB. Should these fail to conclude, the following three mechanisms shall apply, as appropriate. Any dispute between Funding Agencies shall be resolved by negotiation or, failing that, by arbitration through the President of the CERN Council, who will use defined arbitration procedures where they exist and will otherwise adopt one at his or her discretion. Any dispute between a Funding Agency and CERN will be resolved using standard CERN procedures for the resolution of such disputes. Any dispute between Institutes will be resolved according to Collaboration procedures.

14.2 It is understood that any issues that have arisen during the lifetime of the Construction MoU shall be without prejudice to the rights and obligations laid down in this M&O MoU. No party shall be entitled under this M&O MoU to reduce, retain or set-off any obligation due under the Construction MoU.

## Annex 1 : ALICE Institutions, their Contact Physicists and Representatives.

| Country | Town | Institute | Representative |
|---|---|---|---|
| Armenia | Yerevan | Yerevan Physics Institute | A. Grigorian |
| CERN, Switzerland | Geneva | European Laboratory for Particle Physics | J.-P. Revol |
| China | Beijing | China Institute of Atomic Energy | S. Zhou |
| | Wuhan | Institute of Particle Physics, Hua-Zhong Normal University | X. Cai |
| Croatia | Zagreb | Ruder Boskovic Institute | K. Kadija |
| | Zagreb | University of Zagreb | M. Marusic |
| Czech Republic | Prague | Institute of Physics, Academy of Sciences of the Czech Republic | P. Závada |
| | Rez u Prahy | Nuclear Physics Institute, Academy of Sciences of the Czech Republic | M. Sumbera |
| Denmark | Copenhagen | Niels Bohr Institute, University of Copenhagen | J.J. Gaardhøje |
| Finland | Jyväskylä / Helsinki | Department of Physics, University of Jyväskylä and Helsinki Institute of Physics | W.Trzaska |
| France | Clermont-Ferrand | Université Blaise Pascal de Clermont-Ferrand II (CNRS-IN2P3) | P. Dupieux |
| | Lyon | Institut de Physique Nucléaire de Lyon, CNRS-IN2P3 and Université Claude Bernard Lyon-I | J.-Y. Grossiord |
| | Nantes | Laboratoire de Physique Subatomique et des Techniques Associées, Ecole des Mines de Nantes, CNRS-IN2P3 and Université de Nantes | G. Martinez Garcia |
| | Orsay | Institut de Physique Nucléaire, Université de Paris-Sud CNRS-IN2P3 | Y. Le Bornec |
| | Saclay | Commissariat à l'Energie Atomique / DSM / DAPNIA | A. Baldisseri |
| | Strasbourg | Institut de Recherche Subatomique and Laboratoire d'Electronique et de Physique de Systèmes Instrumentaux, Université Louis Pasteur and IN2P3 | J.P. Coffin |
| Germany | Darmstadt | Gesellschaft für Schwerionenforschung | P. Braun-Munzinger |
| | Darmstadt | Technische Universität | H. Oeschler |
| | Frankfurt | Institut für Kernphysik, Johann-Wolfgang-Goethe Universität | R. Stock |
| | Heidelberg | Kirchhof-Institute for Physics, Ruprecht-Karls Universität | V. Lindenstruth |
| | Heidelberg | Physikalisches Institut, Ruprecht-Karls Universität | J. Stachel |
| | Münster | Institut für Kernphysik, Westfälische Wilhelms-Universität | R. Santo |
| Hungary | Budapest | KFKI Research Institute for Particle and Nuclear Physics, Academy of Science | G. Palla |
| India | Aligarh | Physics Department, Muslim University | M. Irfan |
| | Bhubaneswar | Institute of Physics | D. Mahapatra |

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| | Calcutta | Saha Institute of Nuclear Physics | B. Sinha |
| | Calcutta | Variable Energy Cyclotron Centre | Y. Viyogi |
| | Chandigarh | High Energy Physics Group, Panjab University | M. Aggarwal |
| | Jaipur | Physics Department, University of Rajasthan | S. Raniwala |
| | Jammu | Physics Department, Jammu University | L. Mangotra |
| Italy | Alessandria | Facoltà di Scienze dell'Università | L. Ramello |
| | Bari | Dipartimento Interateneo di Fisica and Sezione INFN and Politecnico | E. Nappi |
| | Bologna | Dipartimento di Fisica dell'Università and Sezione INFN | M. Basile |
| | Cagliari | Dipartimento di Fisica dell'Università and Sezione INFN | S. Serci |
| | Catania | Dipartimento di Fisica dell'Università and Sezione INFN | A. Palmeri |
| | Legnaro | Laboratori Nazionali di Legnaro | R. Ricci |
| | Padua | Dipartimento di Fisica dell'Università and Sezione INFN | M. Morando |
| | Rome | Dipartimento di Fisica dell'Università di Roma I 'La Sapienza' and Sezione INFN | S. di Liberto |
| | Salerno | Dipartimento di Scienze Fisiche "E.R.Caianiello", Università di Salerno and INFN | L. Cifarelli |
| | Trieste | Dipartimento di Fisica dell'Università and Sezione INFN | A. Vacchi |
| | Turin | Dipartimenti di Fisica dell'Università di Torino and Sezione INFN | M. Gallio |
| JINR, Russia | Dubna | Joint Institute for Nuclear Research | A. Vodopianov |
| Mexico | Mexico City | Centro de Investigación y de Estúdios Avanzados<br>Instituto de Ciencias Nucleares UNAM<br>Instituto de Fisica UNAM | G. Herrera Corral |
| The Netherlands | Utrecht/ Amsterdam | NIKHEF | P. Kuijer |
| Norway | Bergen | Department of Physics, University of Bergen | D. Röhrich |
| | Bergen | Bergen College | H. Helstrup |
| | Oslo | Department of Physics, University of Oslo | G. Lovhoiden |
| Poland | Cracow | H. Niewodniczanski Institute of Nuclear Physics, High Energy Physics Department | J. Bartke |
| | Warsaw | Soltan Institute for Nuclear Studies | T. Siemiarczuk |
| | Warsaw | Warsaw University of Technology | J. Pluta |
| Portugal | Lisbon | Instituto Superior Técnico, Technical University of Lisbon | J. Seixas |
| Republic of Korea | Kangnung | Kangnung National University | D. W. Kim |
| | Pohang | Pohang Accelerator Laboratory | J. Choi |
| Romania | Bucharest | National Institute for Physics and Nuclear Engineering | M. Petrovici |
| Russia | Gatchina | St. Petersburg Nuclear Physics Institute | V. Samsonov |

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|---|---|---|---|
| | Moscow | Institute for Nuclear Research, Academy of Science | A. Kurepin |
| | Moscow | Institute for Theoretical and Experimental Physics | A. Smirnitski |
| | Moscow | Russian Research Center 'Kurchatov Institute' | V. Manko |
| | Moscow | Moscow Engineering Physics Institute | V. Grigoriev |
| | Novosibirsk | Budker Institute for Nuclear Physics | Y. Pestov |
| | Protvino | Institute for High Energy Physics | S. Sadovski |
| | Sarov | Russian Federal Nuclear Center | R. Ilkaev |
| | St Petersburg | Institute for Physics of St.Petersburg State University, Mendeleev Institute for Metrology and Meson Scientific Association | G. Feofilov |
| Slovak Republic | Bratislava | Comenius University, Faculty of Mathematics, Physics and Informatics | B. Sitar |
| | Kosice | Institute of Experimental Physics, Slovak Academy of Sciences and Faculty of Science, P.J. Safarik University | L. Sandor |
| Sweden | Lund | Division of Cosmic and Subatomic Physics, University of Lund | H.-A. Gustafsson |
| Switzerland | Lausanne | Integrated System Laboratory (ISL), Ecole Polytechnique Fédérale de Lausanne | M. Mattavelli |
| South Africa | Cape Town | University of Cape Town | J. Cleymans |
| Ukraine | Kharkov | National Scientific Centre 'Kharkov Institute of Physics and Technology' | N. Maslov |
| | Kharkov | Scientific and Technological Research Institute of Instrument Engineering | V. Borchtchov |
| | Kiev | Department of High Energy Density Physics, Bogolyubov Institute for Theoretical Physics, National Academy of Sciences of Ukraine | G. Zinovjev |
| United Kingdom | Birmingham | School of Physics and Space Research, University of Birmingham | J. Kinson |
| United States | Oak Ridge TN | Instrumentation and Controls Division, Oak Ridge National Laboratory | M. Simpson |
| | Columbus OH | Department of Physics, Ohio State University | T. Humanic |
| | Columbus OH | Ohio Supercomputer Center | K. Flurchick |

## Annex 2 : ALICE Funding Agencies and their Representatives.

| Country | Agency | Place | Represented by |
|---|---|---|---|
| Armenia | Yerevan Physics Institute | Yerevan | H. Asatryan |
| CERN | European Laboratory for Particle Physics | Geneva | W.D. Schlatter |
| China | Natural Science Foundation of China | Beijing | N. Wang |
| Croatia | Ministry of Science and Technology of Republic Croatia | Zagreb | H. Kraljevic |
| Czech Republic | Ministry of Industry and Trade | Prague | F. Suransky |
| Denmark | Danish Natural Science Research Council | Copenhagen | J.R. Hansen |
| Finland | Helsinki Institute of Physics | Helsinki | D.-O. Riska |
| France | Commissariat à l'Energie Atomique | Paris | F. Gounand |
| | IN2P3 | Paris | D. Guerreau |
| | | | |
| Germany | Bundesministerium für Bildung und Forschung | Bonn | R. Koepke |
| | Gesellschaft für Schwerionenforschung | Darmstadt | W.F. Henning |
| Hungary | Ministry of Education, Research and Development Division | Budapest | G. Szabo |
| India | Department of Atomic Energy | Mumbai | A. Kakodkar |
| | Department of Science and Technology | New Delhi | V.S. Ramamurthy |
| Italy | INFN | Rome | E. Iarocci |
| JINR | Joint Institute for Nuclear Research | Dubna | A. Sissakian |
| Mexico [1)] | Consejo Nacional de Ciencia y Tecnologia and Instituto de Ciencias Nucleares | Mexico City | A. Serrano<br>J.C. D'Olivo |
| The Netherlands | NIKHEF | Amsterdam | J. Engelen |
| Norway | Norwegian Research Council | Oslo | S. Irgens-Jensen |
| Poland | State Committee for Scientific Research | Warsaw | M. Kleiber |
| Portugal [1)] | | | |
| Republic of Korea [1)] | | | |
| Romania | Ministry for Education and Science | Bucharest | S.C. Valeca |
| Russia | Ministry of Science and Technologies | Moscow | M.P. Kirpichnokov |
| Slovak Republic | Ministry of Education of the Slovak Republic | Bratislava | D. Valachovic |
| South Africa [1)] | University of Cape Town | Cape Town | J. Cleymans |
| Sweden | The Swedish Research Council | Stockholm | L. Gidefeldt |
| Switzerland | Ecole Polytechnique Fédérale | Lausanne | D. Mlynek |
| Ukraine | Ministry of Ukraine for Education and Science | Kiev | B. Grynyov |
| United Kingdom | Particle Physics and Astronomy Research Council | Swindon | R.Wade |
| United States | Department of Physics, Ohio State University | Columbus OH | T. Humanic |

[1)] Level of contributions under discussion

**Annex 3 : General Conditions for Experiments Performed at CERN.**

**ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE**

**CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH**

# GENERAL CONDITIONS

## APPLICABLE TO

## EXPERIMENTS PERFORMED AT CERN

14 April 2000

# *GENERAL CONDITIONS*

***applicable to***

***Experiments Performed at CERN***

The mission of the European Organization for Nuclear Research (CERN) is to sponsor international scientific research in high-energy physics.

This document sets out the rules and procedures concerning organisational, managerial and financial matters, which apply to all Universities and Research Institutions in connection with their participation in an experiment at CERN.

This document also addresses CERN's role as that of a Host Laboratory, to be distinguished from CERN's scientific responsibility as a member of an experiment Collaboration.

## 1. SCOPE OF APPLICATION

1.1. The General Conditions apply to experiments carried out at CERN by the combined efforts of several Universities and Research Institutions.

1.2. These experiments require approval by the CERN Research Board and the Director-General after consideration of written proposals submitted to the appropriate experiments committees, taking into account scientific interest, technical feasibility and the constraints imposed by available resources.

1.3. The General Conditions do not apply to "Recognised Experiments", the definition of which was decided by the CERN Research Board (CERN/DG/RB 99-285). The conditions applicable to such experiments are decided by the Research Board on a case-by-case basis and any individual members of these experiments who become registered as CERN users are subject to the rules in operation on the CERN site governing this category of personnel.

## 2. PARTIES AND THEIR REPRESENTATION

2.1. The Parties concerned include:

- CERN as Host Laboratory, hereinafter referred to as "***CERN as Host***" (or simply "CERN") - in this connection, the "***CERN site***" refers to all parts of CERN's fenced-in territory and all of its underground works,

- the Institutions responsible for the research teams taking part in the experiments and forming ***the Collaborating Institutions,*** hereinafter collectively referred to as the ***Collaboration***. CERN may be a Collaborating Institution as well as Host Laboratory.

2.2. Each Party shall have a Representative:

- CERN as Host shall be represented by a ***Director of Research,*** acting on behalf of the Director-General.

- The Collaboration shall be represented by a duly appointed ***Spokesperson***, who represents the Collaboration to the outside and who co-ordinates its work. Where the Spokesperson is not stationed permanently at CERN, the Collaboration shall appoint in addition a ***Contactperson*** at CERN.

- In its relations with CERN, each Collaborating Institution taking part in the experiment shall be represented by a **team member** appointed by the relevant Institution and/or a **member** of the relevant **Funding Agency**.

2.3. All Parties shall assume responsibility for ensuring that all members of their teams comply with these General Conditions.

## 3. BASIC DOCUMENTS GOVERNING THE COLLABORATION

3.1. The following documents shall constitute the formal basis for experiments performed at CERN:

3.1.1. the ***EXPERIMENTAL PROPOSAL***, after its approval by the CERN Research Board;

3.1.2. ***TECHNICAL DESIGN REPORTS***, where appropriate;

3.1.3. a ***MEMORANDUM OF UNDERSTANDING,*** which sets out the detailed arrangements and provisions specific to the experiment and which must be agreed and signed by CERN as Host and by the Collaborating Institutions and/or Funding Agencies; special agreements or protocols of relevance may be appended to the Memorandum of Understanding;

3.1.4. the present ***GENERAL CONDITIONS,*** which the Parties accept by signing the Memorandum of Understanding, except as otherwise specified therein.

### Contents of the Memorandum of Understanding

3.2. As a guide, the essential parts of the Memorandum of Understanding are the following:

a) a list of the Collaborating Institutions and/or the Funding Agencies, responsible for the teams in the Collaboration;

b) details of the persons with specific responsibilities in the experiment;

c) - the definition of the obligations of the Parties with respect to the construction of the detector and the auxiliary equipment;
   - a breakdown of the funding requirements for the main items of the detector and of the auxiliary equipment, together with the contributions of the Parties;
   - a timetable for the construction and installation of the equipment to be provided for the experiment;

d) the obligations of the Parties concerning the installation, operation and maintenance of the detector and auxiliary equipment, unless they are specified in a separate Maintenance and Operation agreement;

e) a mechanism for the resolution of disputes amongst the Parties;

f) an explicit reference to the General Conditions (in particular 6.7, 6.8 and 6.13), which the Parties accept unless otherwise specified in the Memorandum of Understanding; moreover, references should be made to the specific agreements and protocols relevant to the experiment.

## 4. ORGANISATION OF THE COLLABORATION

### Internal autonomy and co-ordination with CERN

4.1. In its internal relations, the Collaboration is free to take such organisational decisions as deemed necessary. However, in preparing and performing the experiment, the Collaboration shall take into account the rules in force on the CERN site. In particular, financial arrangements between CERN and the Collaboration shall be subject to the Financial and Administrative Provisions for Visiting Teams currently in force.

### Co-ordination in matters of safety

4.2. The Leader of the CERN Division with responsibility for the physics programme to which the experiment belongs shall appoint a Group Leader in Matters of Safety (GLIMOS) on the proposal of the Spokesperson of the Collaboration. The rights and obligations of the GLIMOS are defined in the document "Safety Policy at CERN SAPOCO/42".

### Finance Review Committee/Resources Review Board

#### Initial Decision

4.3. For experiments involving large capital investments, a Finance Review Committee (FRC) or a Resources Review Board (RRB) may be set up in agreement with all the Parties concerned.

#### Membership

4.4. The FRC/RRB will consist of one representative of each Funding Agency or Collaborating Institution, and the Managements of CERN and the Collaboration. It will be chaired by the appropriate Director of Research.

#### Terms of reference

4.5. The role of the FRC/RRB includes:

- reaching agreement on the Memorandum of Understanding;
- monitoring the Common Projects and the use of the Common Funds;
- monitoring the general financial and manpower support;
- approving a maintenance and operation procedure and monitoring its functioning;
- approving the annual construction and maintenance & operation budgets.

4.6. The Collaboration Management reports to the FRC/RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

## 5. CERN'S OBLIGATIONS AS HOST LABORATORY

5.1. CERN is the Host Laboratory for the Collaboration. The provisions of this Section concern its obligations as Host.

### PRINCIPLES

#### Installation

5.2. CERN will agree to the installation of the detector, its auxiliary equipment and counting rooms in the appropriate experimental area, provided that they satisfy CERN safety standards.

#### Duration

5.3. CERN will agree to keep the detector on-site during the data taking for the experimental programme approved by its Research Board.

#### Network Connections

5.4. CERN agrees that computers and peripherals belonging to the Collaboration, which are needed for the operation of the detector and its auxiliary equipment, may be connected to the CERN Computer network, provided they conform to its compatibility standards.

#### Insurance[1]

- ***Property***

5.5. The items belonging to the Collaboration and the Collaborating Institutions, once they have been officially accepted on the CERN site, shall be insured at CERN's expense and under the conditions and within the limits set out in the relevant insurance policy against the risks of fire, explosion, natural disaster and water damage.

- ***Third Party Liability***

5.6. Any third party liability of the Collaboration, the Collaborating Institutions and their personnel arising from the experiment shall be insured at CERN's expense under the conditions and within the limits set out in the relevant insurance policy.

- ***Limitation of coverage***

5.7. However, CERN's insurance coverage is effective only above specified amounts of excess. Any amount not covered by CERN's insurance policies shall be for the account of the Collaboration. CERN shall not be liable for any loss or damage arising from or in connection with the experiment.

#### Social insurance

5.8. Independently of the foregoing provisions, social insurance cover for the experimental teams shall remain the responsibility of the employer institutions concerned.

[1] CERN's insurance policies are currently under review and it is intended that new insurance policies will come into effect on 1 January 2003. CERN does not warrant that the new insurance policies will continue to cover the risks set out in clauses 5.5 and 5.6 and accepts no liability in this connection.

## SERVICES

### User Support and Users Office

5.9. CERN will provide access to its services, as described in the document "CERN User's Guide". The Users Office will provide assistance, if required, on questions concerning access to the services provided by CERN.

### Standard Services

5.10. CERN will generally provide, for the duration of the experiment, free of charge and within the limits and general constraints imposed by the available resources and schedules of accelerators, the standard services and facilities listed below:

***Particle beams and equipment***

a) particle beams and related shielding, monitoring equipment and standard communication with the accelerator control rooms;

b) beam time allocation and scheduling, following the recommendations of the relevant Experiment Committee;

c) test beam time for testing prototypes and calibrating final detector elements, subject to the normal scheduling and allocation procedures;

***Space***

d) floor space in the experimental area(s) for the experimental detector and its auxiliary equipment;

e) laboratory and hall space for construction, testing and assembly of equipment;

f) temporary, short-term storage place for spare parts, handling and assembly tools, detector and auxiliary equipment that is awaiting installation or removal. CERN reserves the right to charge longer term storage of the above items to the Collaborating Institutions;

g) office space, equipped with standard furniture and infrastructure facilities including network connections, telephones and electricity;

***Supplies and installations at the experiment***

h) assistance with the installation and removal of the detector and its auxiliary equipment, such as the provision of crane and rigging services, geometrical survey and alignment, transport of equipment on and between the parts of the CERN site, as well as inside the experimental areas;

i) mechanical infrastructure, local infrastructure for the supply of mains electricity, raw cooling water, compressed air and standard connections to the CERN communication network;

***Computing***

j) central computing resources for the Collaboration for the duration of the experiment in amounts to be decided by the normal CERN allocation procedures;

***Transport of persons***

k) basic transportation for personnel between the main parts of the CERN site;

***Safety services***

l) access to its safety services for advice, inspection and control, and first aid or other emergency help;

***Administrative services***

m) access to its administrative services to help the Collaboration in financial matters, in accordance with the CERN Financial Rules and in particular with those applying to Visiting Teams.

**Special Services**

5.11. A variety of services other than those specified above may be provided to the Collaborating Institutions on request, subject to the availability of resources. Such services will be charged to the Collaborating Institutions according to the rules currently in force at CERN.

**Special Equipment**

5.12. Any additional infrastructure equipment to be provided by CERN shall be explicitly mentioned in the Memorandum of Understanding. The respective obligations of CERN and of the Collaborating Institutions with regard to the construction, operation and maintenance of this equipment shall also be specified therein or in the Maintenance and Operation agreement, where this is a separate document.

## 6. OBLIGATIONS OF THE COLLABORATING INSTITUTIONS

**Basic Obligations**

6.1. The team members and property of Collaborating Institutions shall, while located on the CERN site, be subject to the authority of the Director-General of CERN and shall comply with the regulations in force on the Organization's site. Each Collaborating Institution shall nominate a Team Leader who is responsible, among other things, for ensuring that all members of the team (paid academic, research, technical and administrative staff and registered students) are aware of the regulations and obligations, and of the need to comply with them at all times while on the CERN site.

**Medical surveillance and certificates**

6.2. Each Collaborating Institution sending team members to CERN shall remain responsible as employer for the medical surveillance of its team members and, in the case of team members who are to work in conditions deemed to constitute special risks (e.g. radiation controlled areas), shall supply a certificate of medical fitness on first arrival at CERN.

**Safety briefings and inspections**

6.3. Collaborating Institutions shall participate in safety meetings and studies of their experiment, and shall accept the right of the CERN safety personnel to carry out safety inspections as well as other safety measures set out in the document "Safety Policy at CERN - SAPOCO/42".

**Supply of equipment**

6.4. The Collaborating Institutions shall make available on the CERN site, according to an agreed timetable and in working order, the equipment that they have undertaken to supply and to commission. The Spokesperson shall inform the appropriate Director of Research of any significant failure to meet the agreed schedule. For experiments with FRCs or RRBs, these bodies will monitor such matters.

**Ownership status**

6.5. The delivery of items to the CERN site, or the handling of such items there, will not affect the property rights relevant to those items, unless otherwise formally agreed with the owner. On the other hand, the ownership of equipment no longer required by the Collaboration can, subject to formal mutual agreement, be transferred to CERN, where this is in the mutual interest of CERN and the Collaboration concerned.

**Ownership inventory**

6.6. As a condition of coverage by CERN's Insurance, each Collaborating Institution must provide CERN with a list of the property it installs on the CERN site. All equipment delivered to the CERN sites must be properly documented to indicate its ownership status, handling requirements and any potential hazards that it may pose. It shall keep the list up to date and, where necessary, inform CERN of any modifications to it.

**Transport of equipment**

6.7. Each Collaborating Institution supplying equipment shall be responsible for its delivery to and removal from the CERN site.

**Installation and dismantling of equipment**

6.8. The Collaboration is collectively responsible for the installation and dismantling of the equipment supplied by the Collaborating Institutions, in common or individually.

**Operation and maintenance costs of equipment**

6.9. The Collaborating Institutions shall be collectively responsible for the operation and maintenance of the equipment supplied by them, and for providing the resources necessary to carry out the experimental programme. The resources needed to operate and maintain the infrastructure and other equipment supplied by CERN as Host shall be provided by CERN.

**Assignment of equipment**

6.10. Any Party providing equipment undertakes to continue to make it available to the Collaboration at CERN until the experiment is officially declared to have been completed (see 8.2 below).

**Early removal of equipment**

6.11. If equipment provided by a Collaborating Institution is, in the opinion of the Collaboration, no longer required, the Parties may agree to and request its removal from the CERN site under the responsibility of the Institution concerned.

**Release of space**

6.12. Space allocated for construction and assembly should be released when these activities have been terminated. CERN reserves the right to change the space allocation during the lifetime of the experiment. As soon as the experiment is declared to have been completed (see 8.2 below), all space used by the Collaboration, including office and laboratory space, and the space used for testing and running the experiment, will be made available to CERN for reallocation.

**Removal of equipment**

6.13. Equipment associated with an experiment shall be removed from the CERN site within six months following a request from the CERN Division Leader concerned.

## 7. INTELLECTUAL PROPERTY

**Free use of knowledge and data**

7.1. CERN is bound by its Convention to publish or otherwise make generally available the results of its experimental and theoretical work. In addition, subject to clause 7.2 hereunder, each Collaborating Institution and CERN as the Host Laboratory is entitled to use for its own purposes any data and knowledge arising from the preparation or execution of the experiment.

**Matters for prior agreement**

7.2. Title to any patentable invention or any know-how arising from the preparation or execution of the experiment is vested in the Collaborating Institution(s) which is/are its author(s), who shall decide on the taking of measures, at its/their own expense, to protect such invention or know-how and who shall grant each Collaborating Institution and CERN a free, perpetual and irrevocable license to use such invention or know-how for its own purposes. Such license does not include the right to sub-license.

## 8. FINAL PROVISIONS

### Modifications and formal amendments

8.1. The Collaboration shall reach agreement on any modification or addition to the experiment that affects the terms of the Memorandum of Understanding and shall inform CERN of such changes. Where the changes constitute a substantial change to the experiment, they will be submitted to the appropriate committee for approval and acceptance by CERN. In cases where the Collaboration has an FRC/RRB, the latter bodies must also approve any such changes. Major modifications shall be approved as formal amendments to the Memorandum of Understanding and signed by the representatives of all the Parties.

### Duration of applicability of the Memorandum of Understanding

8.2. Unless the duration of applicability is specified in the Memorandum of Understanding, the terms and conditions of the Memorandum of Understanding will apply until the appropriate CERN Research Director, in agreement with the Spokesperson, declares the experiment to have been completed, dismantled and the arrangements for its disposal agreed.

### Observance of the Memorandum of Understanding

8.3. The Memorandum of Understanding formalises the agreement reached between all the Parties on the experiment, who will do their best to adhere to its provisions. Any default under its provisions will be dealt with by the Collaboration, in consultation with the CERN Management.

### Relevant documents

8.4. The following documents are fully applicable in the execution of the Memorandum of Understanding:

- the CERN Users' Guide,
- the Safety Guide for CERN experiments,
- the Safety Policy at CERN - SAPOCO/42,
- Financial Guidelines for the LHC Collaborations (CERN/FC/3796) - for the LHC experiments only,
- Financial and Administrative Provisions for Visiting Teams.

### ACCU

8.5. The Advisory Committee of CERN Users (ACCU) promotes links between CERN Management and the User Community and advises CERN Users on the working conditions and the arrangements for technical support.

## Annex 4 : Sub-detector Structure of the ALICE detector.

(Annex 3 of the Memorandum of Understanding for Collaboration in the Construction of the ALICE Detector, ALICE RRB-D 00-41)

| Detector System | Cost (MCHF) | |
|---|---|---|
| Silicon Pixel (SPD) | 2.756 | |
| Silicon Drift (SDD) | 5.200 | |
| Silicon Strip (SSD) | 10.270 | |
| ITS Mechanics and Cooling | 0.989 | |
| **Total Inner Tracking System (ITS)** | | **19.214** |
| Time Projection Chamber (TPC) | 15.616 | |
| Transition Radiation Detector (TRD) [1)] | 7.000 | |
| Time-of-Flight (TOF) [2)] | 14.605 | |
| Pestov / PPC Prototypes | 0.40 | |
| High Momentum Particle Identification (HMPID) | 2.091 | |
| Photon Spectrometer (PHOS) | 10.504 | |
| **Total Central Detectors** | | **50.216** |
| Photon Multiplicity Detector (PMD) | 0.929 | |
| CASTOR | 0.527 | |
| Zero Degree Calorimeter (ZDC) | 1.048 | |
| Forward Multiplicity Detector (FMD) | 0.816 | |
| T0 | 0.311 | |
| **Total Forward Detectors** | | **3.631** |
| Tracking Chambers | 8.777 | |
| Trigger Chambers | 1.726 | |
| Dipole Magnet | 3.993 | |
| Absorbers | 4.732 | |
| **Total Muon Arm** | | **19.228** |
| Data Acquisition (DAQ) | 6.927 | |
| Trigger | 0.782 | |
| **Total DAQ/Trigger** | | **7.709** |
| Point 2 | 5.040 | |
| Magnets | 1.882 | |
| **Infrastructure** | | **6.922** |
| **Common Projects** | | **11.953** |
| **Total Alice Cost** | | **118.873** |

[1)] Cost for ~ 1/2 of the full acceptance, cost estimate preliminary.

[2)] Cost under review by CORE, current estimate 11.6 to 14.6 MCHF.

# Annex 5 : Management Structure of the ALICE Collaboration.

## 5.1 ALICE Organisation

ALICE Organisation

Revision 3

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# I - General

The goal of the ALICE Collaboration (the 'Collaboration') is to build the ALICE detector for the study of nucleus-nucleus interactions at the CERN Large Hadron Collider and to exploit it for fundamental physics research according to the physics objectives decided by the Collaboration.
The present design of the detector is described in the ALICE Technical Proposal (CERN / LHCC 95-71) and its Addenda (CERN / LHC 96-32 and CERN / LHCC 99-13).

The rules governing the Collaboration and the relations between Institutes, Funding Agencies and CERN as well as the responsibilities of these parties for the construction of the detector are laid down in the ALICE Memorandum of Understanding (ALICE RRB-D 00-41) and its amendments and addenda.

---

## *Membership of the Collaboration*

Member Institutes ('Institutes') of the Collaboration are all those Institutes that have been accepted as such by the Collaboration Board (CB). Any physicist, engineer or graduate student belonging to one of the Institutes, and spending a significant fraction of his or her time working for the Collaboration, is a Member of the Collaboration.

---

## *New Members of the Collaboration*

The candidature of new Institutes is first considered by the Management Board (MB). Once the MB decides that sufficient information is available on its intended participation, the MB presents the candidature to the CB for a vote.

For Institutes joining the Collaboration after the submission of the Memorandum of Understanding, an appropriate financial contribution to the ALICE Common Fund, to be fixed by the CB, will in general be required.

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## *Suspension of Membership*

Membership of an Institute may be suspended by the CB in exceptional circumstances to allow an Institute temporarily to interrupt contributions to the Collaboration. After a maximum of 3 years of suspended membership, the CB decides to reintegrate or exclude the Institute. Upon return to full membership, the annual contributions (art. 6.3 of the ALICE Memorandum of Understanding) not paid during the period of suspension must be paid according to an agreed schedule.

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## *Associate Membership*

The status of Associate Member Institute ('Associate Institute') of the Collaboration may be granted to institutes that are not, or not yet, able to enter into in a long-term commitment to the experiment.

Members of Associate Institutes will not normally be included as authors of publications of the Collaboration, but may be included as authors, with an appropriate footnote, in papers related to their field of activity.

Associate Institutes are required to contribute to the running cost of the experiment but do not normally contribute in cash to the Common fund.

Associate Institutes of the Collaboration do not vote in the CB.

The mechanism for the admission of Associate Institutes is the same as for ordinary Institutes of the Collaboration. The status of Associate Institute is reviewed annually by the CB.

---

### *Non-Fulfilment of Obligations*

If an Institute or Associate Institute does not fulfil the obligations specified in the Memorandum of Understanding or decided by the CB, the MB will consider the case and recommend a decision to the CB. Among the decisions of the CB in such cases may be withdrawal of the Institute's voting right in the CB, and, ultimately, the exclusion of the Institute or Associate Institute from the Collaboration.

In all such cases, the representative of the Institute or Associate Institute concerned must be given the opportunity to be heard.

### *Plenary Meeting*

The full Collaboration has periodic meetings (ALICE weeks) at least 3 times a year. The general assembly, the ALICE Plenary Meeting, meets at these occasions. Plenary Meetings are open to all Members of the Collaboration. The Plenary Meeting may take the form an open, joint meeting of the Physics and Technical Boards ('ALICE Forum').

All major issues concerning the physics aims of ALICE, the design of ALICE detectors and all other important matters are presented to the Plenary Meeting prior to any decision in the CB.

# II - Collaboration Board

## Role

The Collaboration Board (CB) is the policy- and decision making body of the Collaboration.

## Membership

The CB is composed of one representative from each Institute. CB Members appoint a Deputy who may participate in CB meetings. Members of the Management Board (MB) are ex-officio Members of the CB.

Each Institute that contributes in cash to the Common Fund, as outlined in the ALICE Memorandum of Understanding, has one vote in the CB. Institutes that, as an exceptional measure, have been dispensed by the CB from paying the annual cash contribution to the Common Fund, do not vote.

Ex-officio Members of the CB do not vote unless they are at the same time Institute Representatives.

## Chairperson and Deputy

The Chairperson of the CB is elected ad personam by the CB. The term of office is three years. The CB Chairperson may be re-elected.
The CB Chairperson nominates a Deputy Chairperson of the CB after due consultation with the Collaboration. The Deputy Chairperson of the CB is elected ad personam by the CB. The term of office is the same as for the Chairperson.

The Chairperson and the Deputy Chairperson of the CB shall not represent any country, institution, or activity within ALICE. The elections for CB Chairperson takes place at least 6 months before the end of term.

## Meetings

The CB assembles during the ALICE weeks. Additional meetings may be called by the CB Chairperson as the need arises.

## Decision Procedures

Decisions in the CB:

- require the presence of a quorum of at least 50% of the Institutes (including procurations);
- are taken by consensus whenever possible or otherwise by vote;
- require a 2/3 majority of the Institutes represented during the vote.

Voting representatives can carry up to two procurations in addition to their own vote. All votes are open except for elections and re-elections, for which the vote is secret and made by ballot.

If a situation should arise where a decision cannot be reached by vote, a timetable shall be set for the decision to be reached at a subsequent meeting of the CB, but not before a minimum delay of 24 hours. The matter will then be decided if necessary by a simple majority of the Institutes represented.

A change of this ALICE Organisation document always needs a 2/3 majority.

## Agenda and Minutes

The agenda for the CB is prepared by the Chairperson in collaboration with the Spokesperson and the Secretary of the CB. Any member of the CB may request additional topics to be included.

The proceedings of the CB are recorded in minutes. Draft minutes are circulated to members of the CB for approval at the next meeting.

# III - Management Structures

## General

The management structure of ALICE includes four levels of decision-making. At decreasing level of responsibility these levels are:

- Collaboration Board;
- Management Board;
- Technical Board, Finance Board, Offline Board;
- Project level.

At the three levels below the Collaboration Board, the following actions may be taken, depending on the importance and implications of the matter:

- final decisions;
- decisions to be endorsed by the next higher level;
- proposals or recommendations to the next level;
- refer matter to next level without taking position.

The Project Leader or chair of the relevant board decides on a case-by-case basis which of these actions is appropriate. In exceptional cases, this classification can be overruled at a higher level.

---

## Management Board

The ALICE Management Board (MB), through the Spokesperson, is responsible for directing the ALICE experiment.

All important matters of scientific, technical, organisational and financial nature shall be discussed in the MB. Important decisions have to be submitted to the CB for endorsement.

The MB in particular:

- prepares decisions and makes recommendations to the CB;
- endorses Project Leaders on proposal by the Projects;
- has the mandate to resolve controversies within or between the Projects.

Decisions are taken by consensus as documented in the minutes. If no consensus can be reached, the mater is referred to the CB.

The MB is composed of

- Members elected ad personam;
- Representatives of Major Projects;
- Ex-officio Members.

The composition of the MB is decided by the CB. The current composition of the MB is shown in Annex 1.

The meetings of the MB are chaired by the Spokesperson.

The MB meets about once a month. The dates are proposed for the running calendar year and agreed by the MB. The Spokesperson may call for extraordinary meetings of the MB to deal with specific or urgent topics.

The work and the decisions of the MB are recorded in minutes, which are made available to the Collaboration.

---

## Technical Board

The Technical Board (TB) is the principal steering group in all matters of technical co-ordination

The TB is composed of the Project Leaders (PLs) and Subproject Leaders (SPLs) and other Co-ordinators defined by the MB or the TB. Members of the MB, the Deputy Technical Co-ordinator, Spokesperson and Deputy(ies) and the Resources Co-ordinator are ex-officio members of the TB

In the spirit of the mandate of Technical Co-ordinator (TC) the PLs and SPLs work together with and report to the TC on all issues covered by the mandate of the TC. The TC may set up, in consultation with the TB and on an ad-hoc basis, special working groups or task forces to address specific technical issues or advise on certain technical solutions.

The TC presents the work, views and proposals of the TB and to the MB.

The TB is authorised to take technical decisions, which the TB deems not to have a significant impact on performance or cost of the ALICE Detector. More important technical decisions are prepared in the form of a proposal by the TB for discussion at and action by the MB.

The TB shall attempt to reach a consensus on decisions and the preparation of proposals. If no consensus can be reached the matter is referred to the MB. Important decisions of the TB will be presented to the MB for endorsement.

The TB is chaired by the Technical Co-ordinator or in his absence by the Deputy Technical Co-ordinator

The TB meets regularly. Dates are proposed for the running calendar year and agreed by the TB. The meetings are synchronised to the MB meetings. During the ALICE Weeks the 'ALICE Forum' discusses issues of general interest. The TC may call for extraordinary meetings of the TB to deal with specific or urgent topics.

A draft agenda is circulated two weeks and a final agenda one week before a TB meeting. At that time, documentation in electronic form is expected for each agenda item. The agenda will be circulating to the full Collaboration for information. The work and the decisions of the TB will be recorded in minutes, which will also be circulated to the Collaboration.

## Finance Board

The Finance Board (FB) is responsible for dealing with all matters related to the costs and resources of the Collaboration, evaluation of contributions, relations with Funding Agencies, contract policy, and all administrative matters. FB decisions with important implications for the Collaboration must be presented to the CB for endorsement.

The FB is chaired by the Resources Co-ordinator. Members are Link Persons to the different national Funding Agencies. Ex-officio Members are the Spokesperson and Deputy(ies), the CB Chairperson and Deputy and the Technical Co-ordinator and Deputy.

## Physics Board

The Physics Board (PB) co-ordinates and assesses activities concerning physics topics of interest, including the simulation and optimisation of the physics performance of ALICE. It co-ordinates conference contributions, publications and internal ALICE notes. The PB is chaired by the Physics Co-ordinator and composed of the convenors of the physics performance working groups, who are nominated by the Spokesperson and confirmed by the MB. Members of the MB are ex-officio members of the PB The meetings of the PB are open to all Members of the Collaboration.

### *Offline Board*

The Offline Board (OB) is responsible for the development of the Offline of the experiment and for the co-ordination among the offline software of the various sub-detectors, the Data Acquisition (DAQ), project and the global ALICE offline framework. The OB is chaired by the Offline Co-ordinator (OC) and has the following membership:

- up to two representatives from each Subproject;
- one representative from the Physics Board;
- one representative from the Technical Board;
- authors of major software packages.

The OC presents the work, views and proposals of the OB to the MB.

Ex-officio members of the OB are the Co-ordinators responsible for reconstruction, simulation, framework development and production environment. Representatives from the candidate Regional Centres are also members of the OB. The representatives of the Subprojects are nominated by the Subproject Leaders normally for three years.

The OB holds both open and closed meetings.

# IV - Management Functions

## General Rules

- All mandates and appointments are valid for a limited period of time as defined by the Collaboration Board (CB)
- More than one function may be held simultaneously unless the CB considers that there is a conflict of interest.
- All post holders may be re-elected.

## Spokesperson and Deputy

ALICE has one Spokesperson. The Spokesperson is responsible for the execution of the ALICE project and reports to the CB. The Spokesperson represents the Collaboration to the LHC Committee, to CERN Management, and to the outside world.

Candidates are nominated by the CB Chairperson in consultation with CERN Management and elected by the CB. The term of office is three years, renewable.

The Spokesperson can nominate one or two Deputies, for election by the CB.

The Spokesperson shall not represent any country, institution, or activity within ALICE.

## Co-ordinators

The Spokesperson, in consultation with the MB and CERN Management, nominates for confirmation by the CB the Technical Co-ordinator, the Resources Co-ordinator, Offline Co-ordinator and Physics Co-ordinator. The Co-ordinators report through the Spokesperson to the MB. During their term of office, the Co-ordinators must be based at CERN. They shall not represent any country, institution or activity within ALICE.

## Physics Co-ordinator

The Physics Co-ordinator Co-ordinates the activities of the physics working groups to ensure the compatibility between the physics goals and the technical design of ALICE, and is responsible for the ALICE internal notes.

## Technical Co-ordinator

The task of Technical Co-ordination is defined as the co-ordination of the technical activities required to have ALICE ready for data-taking at LHC turn-on. The Technical Co-ordinator (TC) has overall responsibility for the Technical Co-ordination. The TC in particular:

- co-ordinates and monitors the design and construction of the detectors which form the ALICE Experiment;
- proposes corrective actions if necessary;
- co-ordinates ALICE-wide common technical issues and activities;
- is responsible for the execution of Infrastructure Common Projects and the preparation of the ALICE Infrastructure;
- is responsible for the Integration;
- co-ordinates the Installation of ALICE.

The TC monitors, on behalf of the Collaboration, on a regular basis the technical progress of the different Projects and Subprojects through technical reviews, test results and site visits. This monitoring work is carried out in collaboration with the PLs concerned

The TC chooses in consultation with the Spokesperson a Deputy Technical Co-ordinator (DTC).

The TC reports to the Management Board (MB).

The TC and DTC are ex-officio members of the Collaboration Board, Management Board and the Finance Board.

### *Resources Co-ordinator*

The Resources Co-ordinator is responsible for the management of the common resources of the Collaboration.

### *Offline Co-ordinator*

The Offline Co-ordinator (OC) co-ordinates the Offline activities required to design the ALICE detector and analyse the data produced by it. In particular, the OC:

- is responsible for the design and implementation of the Offline framework, including simulation, reconstruction, analysis software and the distributed computing model;
- co-ordinates the offline activities of the institutes participating to the ALICE distributed computing organisation;
- is responsible for the planning of the offline activities.

The OC monitors, on behalf of the Collaboration, on a regular basis, the progress of the Offline of the different detectors. This monitoring work is carried out in collaboration with the responsible persons of the Offline of the concerned detectors members of the Offline Board

The OC is ex-officio member of the Collaboration Board and Finance Board and represents the Offline Project in the Management Board.

### *Other Co-ordinators*

Other Co-ordinators may be appointed by the Spokesperson in consultation with the Management Board.

### *Project Leaders*

The Project Leader (PL) of a Project or a Subproject is responsible for the execution of the Project respecting the technical specifications, the agreed planning and financial resources.

Project Leaders are nominated by consensus of the institutes participating in the project. Project Leaders are proposed to the MB for confirmation. Appointments are for three years, renewable.

### *System Leaders*

Activities of global nature and common interest to ALICE are organised by Systems Leaders (SLs), who have the same status as Project leaders. The SLs co-ordinate, monitor, execute the agreed-upon activities within their mandates. ALICE systems are at present (February 2002):

- Integration, Infrastructure and Installation
- Detector Control System
- Common Issues in Electronics
- Test-Beam Activities

System Leaders are nominated by the TC for endorsement by the MB. Appointments are for three years, renewable.

## ANNEX 1 – Composition of the Management Board

### *The Management Board has the following composition:*

- Four Members elected 'ad personam'.
- The following projects are represented by their Project Leaders: ITS, TPC, TOF, TRD, PHOS and Muon Arm. The DAQ, Trigger and HLT projects are represented by one person, appointed by consensus, the Offline project is represented by the Offline Co-ordinator. The remaining detectors are represented by one of their Project Leaders, appointed by consensus.
- Ex-officio Members of the MB are the Spokesperson and Deputy(ies), the Collaboration Board Chairperson and Deputy, the Technical Co-ordinator and Deputy, the Resources Co-ordinator and the Physics Co-ordinator.

## 5.2 Persons currently holding Management Positions

| | |
|---|---|
| Collaboration Board Chairperson | Lodovico Riccati |
| Deputy | Ingvar Otterlund |
| Spokesperson | Jürgen Schukraft |
| Deputies | Hans Gutbrod |
| | Paolo Giubellino |
| Technical Coordinator | Christian Fabjan |
| Deputy Technical Coordinator | Lars Leistam |
| Resources Coordinator | Hans de Groot |
| Physics Coordinator | Guy Paic |
| Elected Members of the Management Board | Hans Boggild |
| | H.-A. Gustafsson |
| | Jean-Pierre Revol |
| | Reinhard Stock |

| **Project Leaders** | |
|---|---|
| Inner Tracking System | Lodovico Riccati |
| Deputy | Paolo Giubellino |
| Silicon Pixels | Giorgio Stefanini |
| Silicon Drift | Flavio Tosello |
| | Andrea Vacchi |
| Silicon Strip | Jean-Pierre Coffin |
| | Paul Kuijer |
| Time Projection Chamber | Peter Braun Munzinger |
| Transition Radiation Detector | Johanna Stachel |
| Time of Flight Detector | Maurizio Basile |
| High Momentum Particle Identification | Eugenio Nappi |
| Photon Spectrometer | Vladislav Manko |
| Forward Detectors (FMD, T0, V0) | Jens-Jorgen Gaardhoje |
| FMD | Jens-Jorgen Gaardhoje |
| T0 | W. Trzaska |
| V0 | J.-Y. Grossiord |
| Photon Multiplicity Detector | Yogendra Viyogi |
| Zero Degree Calorimeters | Mauro Gallio |
| Muon Arm | Florent Staley |
| Deputy | Ermanno Vercellin |
| Muon Tracking | Yves Le Bornec |
| Muon Trigger | Pascal Dupieux |
| | A. Musso |
| Muon Magnet | D. Swoboda |
| Data Acquisition | Pierre Vande Vyvre |
| High Level Trigger | Volker Lindenstruth<br>Dieter Röhrich |
| Trigger | Orlando Villalobos-Baillie |
| Offline | Federico Carminati |

## Annex 6 : Participation of Institutes in ALICE Sub-systems.

(Annex 7 of the Memorandum of Understanding for Collaboration in the Construction of the ALICE Detector, ALICE RRB-D 00-41).

| Funding Agency | Institute | Detector | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pixel | Drift | Strip | ITS CMA | TPC | TRD | TOF | HMPID | PHOS | Forward | Muon Arm | DAQ Trigger | Infrastr. |
| CERN | CERN | * | | * | | * | | | * | | | * | * | * |
| Czech Republic | Prague | | | | | | | | | * | | | | |
| | Rez u Prahy | | * | | | | | | | | | | | |
| Denmark | Copenhagen | | | | | * | | | | | * | | | |
| Finland | Jyvaskyla | | | * | | | | | | | | | | |
| France | Clermont-Ferrand | | | | | | | | | | | * | | |
| | Lyon | | | | | | | | | | | * | | |
| | Nantes | | | * | | | | | | * | | * | | |
| | Orsay | | | | | | | | | | | * | | |
| | Saclay | | | | | | | | | | | * | | |
| | Strasbourg | | | * | | | | | | | | | | |
| Germany | Frankfurt | | | | | * | | | | | | | * | |
| | GSI | | | | | * | * | | | | | | | |
| | Heidelberg | | | | | * | * | | | | | | * | |
| | Münster | | | | | | * | | | | | | | |
| Hungary | Budapest | | | | | | | | | | | | * | |
| Italy | Alessandria | | * | | | | | | | | * | * | | |
| | Bari | * | | | | | | | * | | | | | |
| | Bologna | | * | | | | | * | | | | | | |
| | Cagliari | | | | | | | | | | * | * | | |
| | Catania | * | | | | | | | | | | | | |
| | Legnaro | * | | | | | | | | | | | | |
| | Padua | * | | | | | | | | | | | | |
| | Rome | * | | | | | | | | | | | | |
| | Salerno | * | | | | | | * | | | | | | |
| | Trieste | | * | * | | | | | | | | | | |
| | Turin | | * | | * | | | | | | * | * | | |
| Netherlands | NIKHEF | | | * | | | | | | | | | | |
| Norway | Bergen | | | | | | | | | * | | | * | |
| | Oslo | | | | | | | | | * | | | * | |
| Poland | Cracow | | | | | * | | | | | | | | |
| | Warsaw-SINS | | | | | | | | | * | | | | |
| | Warsaw TU | | | * | | | | | | | | | | |
| Slovak Republic | Bratislava | | | | | * | | | | | | | | |
| | Kosice | * | | | | | | | | | | | * | |
| Sweden | Lund | | | | | * | | | | | | | | |
| Switzerland | EPFL | | | | | | | | | | | | * | |
| United Kingdom | Birmingham | | | | | | | | | | | | * | |
| Armenia | Yerevan | | | | | | | | | | | * | | |
| China NSFC | Beijing | | | | | | | | | * | | | | * |
| | Shanghai | | | | | | | | | * | | | | |
| | Wuhan | | | | | | | | | * | | | | * |
| Croatia | Zagreb | | | | | * | | | * | | | | | |
| India | Aligarh | | | | | | | | | | | * | | |
| | Bhubaneswar | | | | | | | | | | * | | | |
| | Calcutta Saha | | | | | | | | | | | * | | |
| | Calcutta VECC | | | | | | | | | | * | | | |
| | Chandigarh | | | | | | | | | | * | | | |
| | Jaipur | | | | | | | | | | * | | | |
| | Jammu | | | | | | | | | | * | * | | |
| JINR | JINR | | * | | | | * | | | | | * | | |
| Mexico | Mexico | | * | | | | | | | | | | | |
| Portugal | Lisbon ISTC | | | | | | | | * | | | | | |
| Romania | Bucharest | | | | | | * | | | | | | | |
| Russia | Gatchina | | | | | | | | | | | * | | |
| | INR | | | | | | | | * | | * | | | |
| | ITEP | | | | | | | * | | | | | | |
| | Kurchatov | | | | | | | | | * | * | * | | |
| | MEPHI | | | | | | | | | | * | | | |
| | Novosibirsk | | | | | | | | | | | | | |
| | Protvino | | | | | | | | | * | | | | |
| | Sarov | | | | | | | | | * | | * | | |
| | St Petersburg | | * | * | * | | | | | | * | | | |
| Ukraine | Kharkov | | * | * | | | | | | | | | | |
| | Kiev | | * | * | | | | | | | | | | |
| United States | Ohio | | * | | * | | | | | | | | | |

## Annex 7 : Common Items - Costs that the Collaboration has agreed are to bear at its common expense.

(Annex 11.1 of the Memorandum of Understanding for Collaboration in the Construction of the ALICE Detector, ALICE RRB-D 00-41).

| Reference | | Description | Cost (kCHF) | |
|---|---|---|---|---|
| I – Infrastructure | | | | |
| | 1 – Local area | | | |
| | 1.1 | Counting rooms | 190.0 | |
| | 1.2 | Racks | 110.0 | |
| | 1.3 | Site preparations | 250.0 | |
| | 1.4 | Area control and supervision | 450.0 | |
| | 1.5 | Safety installations | 350.0 | |
| | | Subtotal | | 1,350.0 |
| | 2 – Common support structures | | | |
| | 2.1 | Space-frame | 650.0 | |
| | 2.2 | Central support beams | 330.0 | |
| | 2.3 | Shielding structures | 300.0 | |
| | 2.4 | Steel structures | 545.0 | |
| | 2.5 | Rail systems | 260.0 | |
| | 2.6 | Access and gangways inside L3 magnet | 230.0 | |
| | | Subtotal | | 2,315.0 |
| | 3 – Services | | | |
| | 3.1 | Secondary cooling / ventilation units | 640.0 | |
| | 3.2 | Primary gas installations | 530.0 | |
| | 3.3 | Power distribution | 230.0 | |
| | | Subtotal | | 1,400.0 |
| | 4- Magnets | | | |
| | 4.1 | Repair of cooling system for L3 magnet | 950.0 | |
| | 4.2 | Upgrade of control and services for L3 magnet | 650.0 | |
| | 4.3 | Modification of L3 doors | 410.0 | |
| | 4.4 | Field measurements | 250.0 | |
| | | Subtotal | | 2,260.0 |
| | 5 – Vacuum chamber | | | |
| | 5.1 | Beryllium section | 150.0 | |
| | 5.2 | ZDC cone | 80.0 | |
| | 5.3 | Muon cone | 50.0 | |
| | | Subtotal | | 280.0 |
| | 6 – L3 Dismantling | | | |
| | 6.1 | Removal of L3 detectors and structures | 348.0 | |
| | | Subtotal | | 348.0 |
| II – Data Acquisition | | | | |
| | 7.1 | Level 3 trigger processing farm | 2,000.0 | |
| | | Subtotal | | 2,000.0 |
| III – Offline | | | | |
| | 8.1 | Disk & CPU server | 2,000.0 | |
| | | Subtotal | | 2,000.0 |
| | | | | |
| | | Total | | 11,953.0 |

## Annex 8 : Deliverables (by Sub-detector/System) that are to be maintained and operated by individual Institutes or groups of Institutes.

The table indicates the percentage of the value of the deliverables for each detector system by the different Funding Agencies. The value of the deliverables from any Funding Agency may be found by using this table in conjunction with the detector system values given in Annex 4.

| | Pixel | Drift | Strip | ITS-CMA | TPC | TRD | TOF | HMPID | PHOS | PMD | ZDC | FMD | T0 | MuonTrac | MuonTrig | MuonMag | MuonAbs | DAQ | Trigger | Point 2 | Magnets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CERN | 41 | | 12 | | 16 | | | 25 | | | | | | | | 48 | 29 | 43 | | 91 | 100 |
| Czech Republic | | 6 | | | | | | | 2 | | | | | | | | | | | | |
| Denmark | | | | | 3 | | | | | | | 52 | | | | | | | | | |
| Finland | | | 9 | | | | | | | | | | | | | | | | | | |
| France | | | 20 | | | | | | 4 | | | | | 57 | 53 | 12 | 13 | | | | |
| Germany | | | | | 58 | 85 | | | | | | | | | | | | 29 | | | |
| Hungary | | | | | | | | | | | | | | | | | | 7 | | | |
| Italy | 50 | 87 | 31 | 80 | | | 94 | 64 | | | 100 | | | 17 | 47 | | | | | | |
| Netherlands | | | 21 | | | | | | | | | | | | | | | | | | |
| Norway | | | | | | | | | 7 | | | | | | | | | 7 | | | |
| Poland | | | | | 3 | | | | 4 | | | | | | | | | | | | |
| Slovak Republic | 9 | | | | 2 | | | | | | | | | | | | | | 8 | | |
| Sweden | | | | | 18 | | | | | | | | | | | | | | | | |
| Switzerland | | | | | | | | | | | | | | | | | | 3 | | | |
| United Kingdom | | | | | | | | | | | | | | | | | | 10 | 92 | | |
| Armenia | | | | | | | | | | | | | | 1 | | | | | | | |
| China | | | | | | | | | 21 | | | | | | | | | | | 9 | |
| Croatia | | | | | 1 | | | 1 | | | | | | | | | | | | | |
| India | | | | | | | | | | 100 | | | | 20 | | | | | | | |
| JINR | | | | | | 11 | | | | | | | | | | 40 | | | | | |
| Romania | | | | | | 5 | | | | | | | | | | | | | | | |
| Russia | | 1 | 1 | 16 | | | 6 | 10 | 62 | | | 4 | 20 | 4 | | | 58 | | | | |
| Ukraine | | 6 | 6 | | | | | | | | | | | | | | | | | | |
| United States | | 0 | | 4 | | | | | | | | | | | | | | | | | |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 56 | 20 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Annex 9 : Headings that give rise to Category A M&O costs

1. Detector related costs
- 1.1 Magnet
- 1.2 Magnet controls
- 1.3 Magnet power supply
- 1.4 Gas systems
- 1.5 Gas consumption
- 1.6 Cooling systems
- 1.7 Cooling fluids (above -50°C)
- 1.8 External cryogenics
- 1.9 Cryogenic fluids (below -50°C)
- 1.10 Moving / hydraulic systems
- 1.11 Detector safety systems
- 1.12 Shutdown activities
- 1.13 General Technical support
- 1.14 UPS maintenance
- 1.15 Electronics pool rentals
- 1.16 Beam pipe & vacuum
- 1.17 Counting & control rooms

2. Secretariat
- 2.1 Secretarial assistance
- 2.2 Economat
- 2.3 Fax, photocopiers, printers
- 2.4 Printing and publication

3. Communications
- 3.1 GSM phones / on-call service
- 3.2 Automatic call-back

4. On-line computing (no recording media)
- 4.1 System management
- 4.2 Data storage, (temporary on disk)
- 4.3 Detector controls
- 4.4 Computers / processors / LANs
- 4.5 Software licenses
- 4.6 Common desktop infrastructure

5. Test beams, calibration facilities
- 5.1 General operation
- 5.2 Common electronics
- 5.3 Electronics pool rentals
- 5.4 Gas systems
- 5.5 Gas consumption
- 5.6 External cryogenics

6. Laboratory operations
- 6.1 Assembly areas, clean rooms
- 6.2 Workshops
- 6.3 Laboratory instruments

7. General services
- 7.1 Cooling & ventilation
- 7.2 Power
- 7.3 Power distribution system
- 7.4 Heavy transport
- 7.5 Cranes
- 7.6 Cars
- 7.7 Cleaning
- 7.8 Survey
- 7.9 Storage space
- 7.10 Common desktop infrastructure
- 7.11 Academic subsistence
- 7.12 Outreach

## Annex 10 : Headings that give rise to Category B M&O costs and the Institutes concerned.

1. Mechanics
2. Gas-system
3. Cryo-system
4. Cooling system
5. Front-end electronics spares
6. Standard electronics
   - 6.1 Power supplies (low voltage, high voltage)
   - 6.2 Crates
   - 6.3 Read-out Modules
7. Controls
   - 7.1 Detector Control System
   - 7.2 Detector Safety System
8. Sub-Detector Spares
9. Areas
   - 9.1 Clean Rooms
   - 9.2 Storage Areas
   - 9.3 Workshops
10. Communications
11. Store Items
12. Manpower @ CERN
    - 12.1 Hired as Industrial Support (CHF)
    - 12.2 Technicians from Collaborating Institutes (FTE)

For each Detector Sub-system, the Institutes concerned by these Category B M&O headings are those involved in the construction, as listed in Annex 6.

## Annex 11 : Headings that give rise to Category C M&O costs.

1. General services
1.1 Safety & radioprotection
1.2 INB compliance
1.3 Radioactive waste disposal
1.4 Access system
1.5 Elevators
1.6 Gerant de site
1.7 Flood control
1.8 Insurance (CERN standard)
1.9 Cleaning
1.10 Office space

## Annex 12 : Rules of Procedure for the M&O Scrutiny Group

12.1 The RRBs of the LHC experiments, acting together, shall appoint a Scrutiny Group to assist them in exercising their duties with respect to the oversight of M&O costs and the approval of M&O spending for the coming year. The Scrutiny Group has a technical role and shall be composed of six persons chosen appropriately by the RRBs acting jointly and four persons chosen by CERN. The Scrutiny Group shall perform its duties for all of the LHC Collaborations. The members chosen by the RRBs shall normally include at least one person from each of a large Member State, a small Member State, a large non-Member State and a small non-Member State.

12.2 In order to promote continuity in its deliberations, appointments to the Scrutiny Group shall normally be for two years, with the possibility of re-appointment. Half of the members chosen by the RRBs and half of those chosen by CERN will be replaced each year. In order to establish this rolling replacement, half of the initial members of the Scrutiny Group will serve for three years.

12.3 The names of new Scrutiny Group members for the current and following year will normally be settled at the spring meeting of the RRBs. For the members to be chosen by the RRBs, the RRB Chairperson will receive nominations. CERN will inform the RRBs of its choice of members. The RRBs will then appoint the Scrutiny Group members by consensus in plenary session.

12.4 The Scrutiny Group shall select its Chairperson from amongst the members chosen by the RRBs.

12.5 At his or her discretion, the Chairperson of the Scrutiny Group will accept that, in exceptional circumstances, a member is replaced at an individual meeting by a named proxy.

12.6 The Scrutiny Group will receive for scrutiny, normally at the spring meetings of the RRBs, the Collaborations' proposals concerning the level, provision and sharing of Category A M&O costs for the following year, along with their reported Category B costs and the proposed responsibilities and commitments for these. It will then carry out its scrutiny activities and will submit its reports for each experiment to the autumn meetings of the RRBs.

# Annex 13 : Participants in the ALICE Collaboration.

## 13.1 ALICE collaboration Scientific staff holding Ph.D. or equivalent qualifications by Funding Agency

**Reference date: January 1, 2002**

### Armenia, Yerevan Physics Institute

**Yerevan**, Yerevan Physics Institute:
A. Grigorian, S. Grigoryan, H. Gulkanyan, V. Kakoyan, Yu. Margaryan.

### CERN

**CERN**, European Laboratory for Particle Physics:
I. Augustin, A. Augustinus, J. Bächler, A. Braem, R. Brun, P. Buncic, R. Campagnolo, M. Campbell, F. Carena, W. Carena, F. Carminati, N. Carrer, P. Chochula, J. Christiansen, J. Chudoba, M. Davenport, J. de Groot, A. Di Mauro, R. Divià, C. Fabjan, A. Fasso, F. Formenti, A. Gheata, P. Giubellino, I. Gonzalez Caballero, C. Gregory, M. Hoch, P. Hristov, A. Jimenez de Parga, L. Jirden, A. Kluge, L. Leistam, JC. Marin, P. Martinengo, M. Masera, T. Meyer, A. Moronval, A. Morsch, L. Musa, G. Paic, D. Perini, F. Piuz, S. Popescu, P. Rodrigues Simoes Moreira, F. Rademakers, J. P. Revol, P. Riedler, K. Safarík, P. Saiz, J.-C. Santiard, K. Schossmaier, J. Schukraft, E. Schyns, W. Snoeys, C. Soos, G. Stefanini, D. Swoboda, P. Szymanski, H. Taureg, P. Vande Vyvre, J. Van Hunen, A. Vascotto, C. Williams and K. Wyllie.

### China, Natural Science Foundation of China

**Beijing**, China Institute of Atomic Energy:
H. Guo, J. Yuan, and S. Zhou.

**Wuhan**, Institute of Particle Physics, Huazhong Normal University:
X. Cai et al.

### Croatia, Ministry of Science and Technology of Republic Croatia

**Zagreb**, Mathematics Department, University of Zagreb:
R. Manger, M. Marusic and G. Nogo.

**Zagreb**, Ruder Boskovic Institute:
T. Anticic and K. Kadija.

### Czech Republic, Ministry of Industry and Trade of the Czech Republic

**Prague**, Institute of Physics, Academy of Science:
J. Mareš, M. Nikl, K. Polák and P. Závada.

**Rez u Prahy**, Academy of Sciences of Czech Republic, Nuclear Physics Institute:
D. Adamová, A. Kugler, M. Sumbera, P. Tlustý, V. Wagner and D. Zákoucký.

## Denmark, Danish Natural Science Research Council

**Copenhagen**, Niels Bohr Institute:
I. Bearden, H. Boggild, J. J. Gaardhoje, O. Hansen and B. S. Nielsen.

## Finland, Helsinki Institute of Physics

**Jyväskylä**, Department of Physics, University of Jyväskylä and Helsinki Institute of Physics:
J. Äystö, M. Komogorov, V. Lyapin, M. Oinonen, V. Ruuskanen and W. Trzaska.

## France, IN2P3

**Clermont-Ferrand**, Laboratoire de Physique Corpusculaire, IN2P3-CNRS, Université Blaise Pascal:
A. Baldit, V. Barret, N. Bastid, P. Crochet, P. Dupieux, A. Genoux-Lubain, F. Manso, P. Rosnet and P. Saturnini.

**Lyon**, Institut de Physique Nucléaire de Lyon (IPNL), IN2P3-CNRS and Université Claude Bernard Lyon-I:
B. Cheynis, L. Ducroux, E. Gangler, J. Y. Grossiord, R. Guernane and A. Guichard.

**Nantes**, Laboratoire de Physique Subatomique et des Technologies Associées (SUBATECH), Ecole des Mines de Nantes, IN2P3-CNRS and Université de Nantes:
A. Boucham, J. P. Cussonneau, H. Delagrange, D. D'Enterria, M. Diaz, B. Erazmus, Ch. Finck, L.. Lakehal-Ayat, P. Lautridou, L. Luquin, L. Martin, G. Martinez-Garcia, D. Peressounko, M. J. Mora, O. Ravel, C. S. Roy, Y. Schutz and A. Tournaire.

**Orsay**, Institut de Physique Nucléaire (IPNO), IN2P3-CNRS and Université de Paris-Sud:
MP. Comets, B. Espagnon, I. Hrivnacova, R. Kunne, Y. Le Bornec, M. Mac Cormick, S. Rousseau and N. Willis.

**Strasbourg**, Institut de Recherches Subatomiques (IreS), IN2P3-CNRS and Université Louis Pasteur:
J. Baudot, J. P. Coffin, M. Germain, C. Kuhn, J. Lutz and A. Michalon.

## France, Commissariat à l'Energie Atomique

**Saclay**, Centre d'Etudes Nucléaires, DAPNIA:
A. Baldisseri, H. Borel, J. Gosset, F. M. Staley and F. Orsini.

## Germany, Gesellschaft für Schwerionenforschung

**Darmstadt**, Gesellschaft für Schwerionenforschung (GSI):
E. Badura, C. Blume, P. Braun-Munzinger, A. Dahlinger, A. Devismes, C. Finck, P. Foka, U. Frankenfeld, C. Garabatos, I. Giese, H. Goringer, H. Gutbrod, M. Ivanov, P. Malzacher, A. Marin, D. Miskowiec, W. F. J. Müller, H. Sako, A. Sandoval, H. Sann, H. R. Schmidt, K. Schwarz, S. Sedykh, H. Stelzer, R. Veenhof and D. Vranic.

## Germany, Bundesministerium für Bildung und Forschung

**Darmstadt**, Institut für Kernphysik, Technische Universität:
H. Oeschler.

**Frankfurt**, Institut für Kernphysik, Johann Wolfgang Goethe-Universität:
P. Buncic, M. Gazdzicki, S. Lange, R. Renfordt, C. Roland, R. Stock and H. Ströbele.

**Heidelberg**, Kirchhoff Institute for Physics, Ruprecht-Karls Universität:
R. Achenbach, V. Angelov, M. Dorn and V. Lindenstruth.

**Heidelberg**, Physikalisches Institut, Ruprecht-Karls Universität:
H. Appelshäuser, V. Catanescu, P. Glässel, N. Herrmann, V. Petrácek, I. Rusanov, R. Schicker, W. Schmitz, H. K. Soltveit, H. J. Specht, J. Stachel, B. Vulpescu, J. P. Wessels, B. Windelband and CC. Xu.

**Münster**, Institut für Kernphysik, Westfälische Wilhelms-Universität:
D. Bucher, R. Glasow, T. Lister, T. Peitzmann, K. Reygers and R. Santo.

## Greece

**Athens**, Institute of Nuclear Physics, NRC Demokritos:
K. Kalfas.

**Athens**, Nuclear and Prticle Physics Division, University of Athens:
A.L.S.Angelis, A.D. Panagiotou and M. Spyropoulou-Stassinaki.

**Ioannina**, University of Ioannina, Department of Physics:
X. Aslanoglou and N.G. Nicolis.

## Hungary, Ministry of Education, Research and Development Division

**Budapest**, KFKI Research Institute for Particle and Nuclear Physics, Hungarian Academy of Sciences:
E. Denes, Z. Fodor and G. Palla.

## India, Department of Atomic Energy and Department of Science and Technology

**Aligarh**, Physics Department, Aligarh Muslim University:
S. Ahmad, T. Ahmad and M. Irfan.

**Bhubaneswar**, Institute of Physics:
R.K. Choudhury and D. P. Mahapatra.

**Calcutta**, Saha Institute of Nuclear Physics:
P. Bhattacharya, S. Bose, S. Chattopadhyay, N. Majumdar, S. Mukhopadhyay, A. Sanyal, S. Sarkar, S. K. Sen and M. Sharan.

**Calcutta**, Variable Energy Cyclotron Centre:
S. Chattopadhyay, M. S. Ganti, T. K. Nayak, S. Pal, R. N. Singaraju, and Y. P. Viyogi.

**Chandigarh**, Physics Department, Panjab University:
M. M. Aggarwal and A. K. Bhati.

**Jaipur**, Physics Department, University of Rajasthan:
R. Raniwala and S. Raniwala.

**Jammu**, Physics Department, Jammu University:
A. Bhasin, A. Gupta, S. Mahajan, L. K. Mangotra, B. V. K. S. Potukuchi and S. S. Sambyal.

## Italy, INFN

**Alessandria**, Facoltà di Scienze dell'Università:
P. Cortese, G. Dellacasa, L. Ramello, E. Scalas and M. Sitta.

**Bari**, Dipartimento Interateneo di Fisica and Sezione INFN:
G. De Cataldo, D. Di Bari, D. Elia, R. A. Fini, B. Ghidini, V. Lenti, V. Manzari, E. Nappi, F. Navach and F. Posa.

**Bari**, Dipartimento di Elettrotecnica ed Elettronica del Politecnico:
M. Castellano, F. Corsi, D. De Venuto and C. Marzocca.

**Bologna**, Dipartimento di Fisica dell'Università and Sezione INFN:
F. Anselmo, P. Antonioli, G. Bari, M. Basile, L. Bellagamba, D. Boscherini, A. Bruni, G. Bruni, G. Cara Romeo, F. Cindolo, M. Corradi, S. De Pasquale, D. Falchieri, A. Gabrielli, E. Gandolfi, P. Giusti, D. Hatzifotiadou, G. Laurenti, M. L. Luvisetto, A. Margotti, M. Masetti, R. Nania, F. Palmonari, A. Pesci, A. Polini, G. Sartorelli, G. Valenti and A. Zichichi.

**Cagliari**, Dipartimento di Fisica dell'Università and Sezione INFN:
C. Cicalo, A. De Falco, M. P. Macciotta-Serpi, A. Masoni, D. Mura, G. Puddu, S. Serci, E. Siddi, L. Tocco and G. Usai.

**Catania**, Dipartimento di Fisica dell'Università and Sezione INFN:
A. Badalà, R. Barbera, F. Librizzi, A. Palmeri, G. S. Pappalardo and F. Riggi.

**Legnaro**, Laboratori Nazionali di Legnaro:
M Cinausero, M. Lombardi, R. A. Ricci and L. Vannucci.

**Padua**, Dipartimento di Fisica dell'Università and Sezione INFN:
F. Antinori, N. Carrer, D. Fabris, M. Morando, G. Nebbia, A. Pepato, E. Quercigh, F. Scarlassara, G. Segato, R. Turrisi and G. Viesti.

**Rome**, Dipartimento di Fisica, Università di Roma "La Sapienza" and Sezione INFN:
S. Di Liberto, M. A. Mazzoni, F. Meddi and GM. Urciuoli.

**Salerno**, Dipartimento di Scienze Fisiche "E.R.Caianiello", Università di Salerno and INFN:
L. Cifarelli, A. Di Bartolomeo, M. Fusco Girard, G. Grella, M. Guida, J. Quartieri, G. Romano and T. Virgili.

**Trieste**, Dipartimento di Fisica dell'Università and Sezione INFN:
V. Bonvicini, L. Bosisio, M. Bregant, P. Camerini, S. Dittongo, E. Fragiacomo, N. Grion, R. Grosso, G.V. Margagliotti, S. Piano, C. Piemonte, A. Rachevski, R. Rui and A. Vacchi.

**Turin**, Dipartimenti di Fisica dell'Università and Sezione INFN:
B. Alessandro, R. Arnaldi, S. Beolé, P. G. Cerello, E. Chiavassa, F. Daudo, N. De Marco, P.G. Innocenti, L. Gaido, M. Gallio, G. Giraudo, M. Idzik, A. Marzari-Chiesa, G. Mazza, P. Mereu, M. Monteno, A. Musso, D. Nouais, A. Piccotti, G. Piragino, L. Riccati, A. Rivetti, E. Scomparin, F. Tosello, E. Vercellin, A. Werbrouck and R. Wheadon.

## JINR

**JINR**, Joint Institute for Nuclear Research:
V. A. Arefiev, B. V. Batiounia, G. S. Chabratova, S.P. Chernenko, V. K. Dodokhov, V. G. Kadychevsky, V. L. Lioubochits, P. V. Nomokonov, YA Panebrattsev, VN. Penev, M. K. Suleimanov, A. S. Vodopianov, V.I. Yurevich, Y.V. Zanevsky and A.I. Zintchenko.

## Mexico, Consejo Nacional de Ciencia y Tecnologia

**Mexico City**, Centro de Investigación y de Estudios Avanzados, Instituto de Ciencias Nucleares and Instituto de Fisica (UNAM):
A. Ayala, JC D'Olivo, R. Hernández Montoya, G. Herrera Corral and L. M. Montaño.

## The Netherlands, NIKHEF

**NIKHEF**, National Institute for Nuclear and High Energy Physics:
M. Botje, J. J. F. Buskop, A. P. De Haas, R. Kamermans, P. G. Kuijer, G. Nooren, R.J.M. Snellings, A. Van Den Brink and N. Van Eijndhoven.

## Norway, Norwegian Research Council

**Bergen**, Department of Physics, University of Bergen:
A. Klovning, W. Olsen, D. Röhrich and K. Ullaland.

**Bergen**,Faculty of Engineering, Bergen College
K. Fanebust and H. Helstrup.

**Oslo**, Department of Physics, University of Oslo:
G. Lovhoiden, B. Skaali, T. S. Tveter, T. Vik and D. Wormald.

## Poland, State Committee for Scientific Research

**Cracow**, Henryk Niewodniczanski Institute of Nuclear Physics, High Energy Physics Department:
J. Bartke, E. Gladysz-Dziadus, E. Górnicki, M. Kowalski and Z. Wlodarczyk.

**Warsaw**, Soltan Institute for Nuclear Studies:
A. Deloff, M. Kozlowski, H. Malinowski, K. Redlich, T. Siemiarczuk, G. Stefanek, L. Tykarski and G. Wilk.

**Warsaw**, University of Technology, Institute of Physics:
J. Grabski, T. J. Pawlak, W. S. Peryt and J. Pluta.

## Romania, Ministry for Education and Science

**Bucharest**, National Institute for Physics and Nuclear Engineering:
A. Andronic, V. Catanescu, M. Ciobanu, C. I. Legrand, M. Petrovici and G. Stoicea.

## Russian Federation, Ministry of Science and Technologies

**Gatchina**, St. Petersburg Nuclear Physics Institute:
Y.A. Berdnikov, A.V. Khanzadeev, V. Nikouline and V. Samsonov.

**Moscow**, Institute for Nuclear Research, Academy of Science:
F. F. Gouber, T. L. Karavitcheva, A. B. Kourepin, I. Pshenichnov, A. I. Rechetine and N. S. Topilskaia.

**Moscow**, Institute for Theoretical and Experimental Physics:
A. B. Kaidalov, M. M. Kats, I. T. Kiselev, S. M. Kisselev, A. N. Martemiyanov, A. V. Smirnitski, L. S. Vorobiev and B. V. Zagreev.

**Moscow**, Moscow Engineering Physics Institute:
V. A. Grigoriev and V. A. Kapline.

**Moscow**, Russian Research Center "Kurchatov Institute":
S. Beliaev, M. Ippolitov, V. I. Manko and, O. Patarakine.

**Novosibirsk**, Budker Institute for Nuclear Physics:
A. R. Frolov and Y. N. Pestov.

**Protvino**, Institute for High Energy Physics:
M.Yu. Bogolyubsky, S. A. Sadovski and V.A. Victorov.

**Sarov**, Russian Federal Nuclear Center (VNIIEF):
R. Ilkaev, V. Punin and J. Vinogradov.

**St. Petersburg**, V.Fock Institute for Physics of St. Petersburg State University, Mendeleev Institute for Metrology and CKBM-Meson Scientific Association:
L.Y. Abramova, V.S. Alexandrov, A.A. Bolonine, M.A. Braun, G.A. Feofilov, S. Guerassimov, S.N. Igolkine, A.A. Kolojvari, V. Kondratiev, I.A. Novikov, S. V.Potapov, O.I. Stolyarov, A.M. Switchev, T.A. Toulina, F.A. Tsimbal, F.F. Valiev, V.V. Vetchernine and L.I. Vinogradov.

## Slovak Republic, Ministry of Education of the Slovak Republic

**Bratislava**, Comenius University, Faculty of Mathematics, Physics and Informatics:
J. Braciník, V. Cerny, V. Hlinka, R. Janik, R. Lietava, M. Pikna, J. Pisút, N. Pisútová, B. Sitar, P. Strmen, and I. Szarka.

**Kosice**, Institute of Experimental Physics, Slovak Academy of Sciences and Faculty of Science P. J. Safárik University:
M. Hnatic, I. Králik, A. Kravcáková, G. Martinská, B. Pastircák, L. Sándor, J. Urbán, S. Vokál and J. Vrláková.

## Sweden, The Swedish Research Council

**Lund**, Division of Cosmic and Subatomic Physics, University of Lund:
H.-A. Gustafsson, J. Nystrand, A. Oskarsson, L. Osterman, I. Otterlund and E. A. Stenlund.

## Ukraine, Ministry of Ukraine for Education and Science

**Kharkov**, National Scientific Centre "Kharkov Institute of Physics and Technology":
A. N. Dovbnya, N. I. Maslov, S. M. Potin and A. F. Starodubtsev.

**Kharkov**, Scientific and Technological Research Institute of Instrument Engineering:
V. N. Borshchov and O. M. Listratenko.

**Kiev**, Department of High Energy Density Physics, Bogolyubov Institute for Theoretical Physics, National Academy of Sciences of Ukraine:
O. P. Pavlenko, Yu.M. Sinyukov and G.M. Zinovjev.

## United Kingdom, Particle Physics and Astronomy Research Council

**Birmingham**, School of Physics and Space Research, University of Birmingham:
I. J. Bloodworth, D. Evans, G. T. Jones, P. Jovanovic, J. B. Kinson, P.I. Norman and O. Villalobos Baillie.

## United States: Oak Ridge National Laboratory

**Oak Ridge TN**, Instrumentation and Controls Division, Oak Ridge National Laboratory:
T. Awes, C. L. Britton, W. L. Bryan and A. L. Wintenberg.

## United States: Ohio State University

**Columbus OH**, Department of Physics, Ohio State University:
T. J. Humanic, I.V. Kotov, M.A. Lisa, B. S. Nilsen and E.R. Sugarbaker.

## 13.2 ALICE collaboration Scientific staff holding Ph.D. or equivalent qualifications – Summary

| Funding Agency | Physicist | Engineer | Phys & Eng |
|---|---|---|---|
| CERN | 53 | 11 | 64 |
| Czech Republic | 10 | | 10 |
| Denmark | 5 | | 5 |
| Finland | 5 | 1 | 6 |
| France CEA | 4 | 1 | 5 |
| France IN2P3 | 42 | 4 | 46 |
| Germany BMBF | 27 | 6 | 33 |
| Germany GSI | 26 | | 26 |
| Greece | 6 | | 6 |
| Hungary | 3 | | 3 |
| Italy | 118 | 13 | 131 |
| Netherlands | 6 | 3 | 9 |
| Norway | 9 | 2 | 11 |
| Poland | 16 | 1 | 17 |
| Slovak Republic | 18 | 2 | 20 |
| Sweden | 5 | 1 | 6 |
| United Kingdom | 6 | 1 | 7 |
| Armenia | 5 | | 5 |
| China NNSF | 6 | 1 | 7 |
| Croatia | 5 | | 5 |
| India | 27 | 3 | 30 |
| JINR | 15 | | 15 |
| Mexico | 5 | | 5 |
| Romania | 4 | 2 | 6 |
| Russia | 41 | 9 | 50 |
| Ukraine | 9 | | 9 |
| USA (Oak Ridge) | 4 | | 4 |
| USA (OSU) | 5 | | 5 |
| **Total** | **485** | **61** | **546** |

## Annex 14 : Non-Member States for which CERN will partially pay the energy costs

14.1 CERN will partially pay the energy costs for the following CERN Non-Member States by virtue of their contributions to the construction of the LHC machine.

1. Canada
2. India
3. Japan
4. Russian Federation
5. United States of America

14.2 Under a co-operation agreement Israel contributes to CERN 20% of the amount that would normally be expected of it as a Member State. The further provisions of this co-operation agreement on the use of these funds lead to the conclusion that CERN should pay 16% of the energy costs for this country.

## Annex 15 : Formula used for determining the sharing of the CERN payment of energy costs amongst the eligible non-Member States.

$M_i$ = contribution to the LHC machine of country *i*

$M_{MS}$ = contribution to the LHC machine of CERN Member States taken together

$M_{NMS}$ = contribution to the LHC machine of the non-Member States listed in Annex 14.1 taken together

$G_i$ = GDP of country *i* (see explanatory note below)

$A_i$ = category A costs for country *i*

$E_{MS}$ = energy costs of the Member States together

$E_{NMS}$ = energy costs of the non-Member States listed in Annex 14.1 taken together

$E_i$ = Energy costs attributable to country *i*

The CERN share $E_{NMS(CERN)}$ of $E_{NMS}$ is determined by the LHC machine contribution of these countries relative to the contribution of the CERN Member States, i.e.

$$E_{NMS(CERN)} = E_{NMS} \,.\, M_{NMS} / M_{MS}$$

Beyond this, the algorithm used for sharing amongst the eligible non-Member States is:

$$\mathbf{E_i = k \,.\, (M_i / G_i) \,.\, A_i} \qquad \text{where} \quad k = E_{NMS(CERN)} \Big/ \sum_{NMS}((M_i / G_i).A_i)$$

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### Explanatory note on the calculation of GDPs

The Gross Domestic Products to be taken into account in preparation for the decision in the autumn of year *n* on the payment of energy costs by CERN in year *n+1* to contributing non-Member States are those for the years of LHC construction (1996-2006). Thus initially the averaged Gross Domestic Product in Swiss francs for each contributing non-Member State is calculated as described in the following two paragraphs.

1. The Gross Domestic Product (GDP) in US Dollars of each contributing non-Member State for the years 1996 to *m*, the last year available ($m \leq n-1$), is obtained from the document "International Financial Statistics" published by the International Monetary Fund (IMF), Washington DC.
2. An average of the resulting data for each contributing non-Member State is calculated by the application of the following formula :

$$(GDP_{1996} + GDP_{1997} + ... + GDP_m) \;/\; (m\text{-}1996+1)$$

When *m* reaches 2006, the averaged GDP for the country in question will cover the whole period of LHC construction and will then be used unchanged in subsequent years.

## Annex 16 : Procedure for the payment of Category A contributions

For Category A expenses, CERN will issue, each calendar year, on the basis of the agreed costs and sharing, invoices in Swiss francs to the Funding Agencies of the various Institutes for payment during that year; any necessary adjustments will be made and taken into account in the following year. Payment of 50% of the amount invoiced will be due not later than 10 February and the remaining 50% not later then 10 June. Advance payments are encouraged. The RRB will be informed at its autumn meeting each year of the interest gained or lost by the Collaboration.

## The European Organization for Nuclear Research (CERN)

and

_____

declare that they agree on the present Memorandum of Understanding for the ALICE Experiment.

Done in Geneva

on _____

For CERN

_____

Roger Cashmore
Director of Research

Done in _____

on _____

For

_____

**ALICE**